of great interest from a theoretical point of view, since it comprises the results of the author's experiments on bitumen, wood charcoal, and coal. The former of these substances, under the influence of hydriodic acid, yields hexylene hydride, the saturated hydrocarbon corresponding to benzene, from which it may be inferred that bitumen is a derivative of benzene, produced by condensation and loss of hydrogen. Charcoal and coal, when treated according to M. Berthelot's method, are transformed into a mixture of various saturated hydrocarbons, identical with those found in petroleum oil. In fact *the coal is changed into petroleum oil.*

THE most important paper in the first three numbers of vol. xiii. of the *Atti della Societa Italiana di Scienze Naturali* (April and November 1870, and January 1871), is a continuation of Prof. Delpino's article on "Dichogamy in the Vegetable Kingdom." In this paper the author passes in review the various modes in which the impregnation of plants is effected, with especial reference to the provisions for the impregnation of one plant by the fecundating organs of another.—M. A. Curò publishes a note on parthenogenesis among the Lepidoptera.—M. F. Sordelli contributes a note on the anatomy of the genus *Acme*, and on some of the hard parts of *Cæcilianella acicula*, illustrated with a plate; and further an anatomy of *Limax Doriæ*, Bourg., also illustrated, and including a tabular arrangement of the species of the genus *Limax*, for the elucidation of the characters of two new species, which the author describes under the names of *L. punctulatus* and *L. Bettonii.*—The Secretary of the Society, Dr. C. Marinoni, notices some remains of *Ursus spelæus* from the Cave of Adelsberg.—M. G. Bellucci gives an account of some evidences of prehistoric man in the territory of Terni.—M. L. Ricca communicates some observations on dichogamy in plants made by him upon the Alps of Val Camonica in 1870; and also a systematic catalogue of the vascular plants growing spontaneously in the olive-zone of the valleys of Diana, Marina, and Cervo, with indications of the special conditions of growth, times of flowering of each species, and occasional remarks upon their characters.—At p. 130 is the description of a supposed hybrid *Orchis*, *O. coriophoro-laxiflora.*—From M. C. Bellotti we have some observations on the disease of flaccidity, which destroys so many silkworms (*morts-flats*) in France and Italy; and from Dr. Taramelli a memoir, illustrated with an elaborate coloured plate, on the ancient glaciers of the Drave, Save, and Isonzo.

SOCIETIES AND ACADEMIES

LONDON

Geological Society, June 7.—Mr. Joseph Prestwich, F.R.S., president, in the chair. Messrs. Henry Collinson and Thomas Milnes Favell were elected Fellows, and Dr. J. J. Kaup, of Darmstadt, was elected a foreign member of the society. The following communications were read:—1. "On the persistence of *Caryophyllia cylindracea* Reuss, a Cretaceous Coral, in the Coral-fauna of the Deep Sea." By Prof. P. Martin Duncan, F.R.S. The author first referred to the synonyms and geological distribution of *Caryophyllia cylindracea*, Reuss, which has hitherto been regarded as peculiar to the White Chalk, and as necessarily an extinct form, inasmuch as it belonged to a group possessing only four cycles of septa in six systems, one of the systems being generally incomplete. The distribution of the *Caryophlliæ* of this group in the Gault and the Upper Chalk, the Miocene, and the Pliocene, was noticed, and also that of the species with the incomplete cycle. The falsity of this generalisation was shown to be proved by the results of deep-sea dredging off the Havannah, under Count Pourtales, and off the Iberian peninsula under Dr. Carpenter and Mr. Gwyn Jeffreys. The former dredged up *Caryophyllia formosa* with four complete cycles, and the latter obtained, from depths between 690 and 1090 fathoms, a group of forms with four complete and incomplete cycles. This group had a Cretaceous facies; one of the forms could not be differentiated from *Caryophyllia cylindracea*, Reuss; and as a species of the genus *Bathycyathus* was found at the same time, this facies was rendered more striking. The representation of the extinct genera *Trochosmilia*, *Parasmilia*, *Synhetia, and Diblasus*, by the recent *Amphiheliæ*, *Paracyathi*, and *Caryophylliæ* was noticed, and it was considered that as the Cretaceous forms throve under the same external conditions, some of them only being persistent, there must be some law which determines the life-duration of species like that which restricts the years of the individual. It was shown that deep-sea conditions must have prevailed within the limits of the diffusion of the ova of coral polyps somewhere on the Atlantic area ever since the Cretaceous period. Mr. Gwyn Jeffreys remembered that at the spot where the coral in question was dredged up the sea-bottom was extremely uneven, varying as much as fifty fathoms within a quarter of a mile. It was also not more than forty miles from land. The species of mollusca dredged up were extremely remarkable, and many were totally different from what he had previously seen. They were, however, living or recent; none of them were Eocene or Miocene, much less Cretaceous, like *Terebratula caput-serpentis.* He quoted from Mr. Davidson other instances of the persistence of forms, especially of the genus *Lingula* from the Silurian formation. The persistence of this species of coral, as well as that of Foraminifera, from the Cretaceous to the present time, was therefore not unique, and other cases of survival from even earlier times might eventually be recognised. Dr. Carpenter, after commenting on the reductions that extended knowledge enabled naturalists to make in the number of presumed species, could not accept the mere identification of species as of the highest importance in connecting the Cretaceous fauna with that of our own day. The identity of genera was, in his opinion, of far more importance. He instanced *Echinothuria* and *Rhizocrinus* as preserving types identically the same as those of a remote period, and as illustrating the continuity of the deep-sea fauna from Cretaceous times. The chemical and organic constitution of the deep-sea bottom of the present day was also singularly analogous to that of the Chalk sea. The low temperature at the bottom of the deep sea, even in equatorial regions, was now becoming universally recognised, and this temperature must have had an important bearing on the animal life at the sea-bottom. Prof. Ramsay thought that there was some misapprehension abroad as to the views held by geologists as to continuity of conditions. They had, however, always insisted on there having been an average amount of sea and land during all time; and the fact of sea having occupied what is now the middle of the Atlantic since Cretaceous time would create no surprise among them. If, however, the bed of the Atlantic were raised, though probably many Cretaceous genera, and even species, might be found, there would on the whole be a very marked difference between these Atlantic beds and those of the Chalk. Mr. Seeley had already, in 1862, put forward views which had now been fully borne out by recent investigation. His conviction was that, from the genera having persisted for so long a time, the genera found in any formation afforded no safe guide as to its age, unless there were evidence of their having since those formations become extinct. Mr. Etheridge maintained that the species in different formations were sufficiently distinct, though the genera might be the same. Recent dredgings had not brought to light any of the characteristic molluscan forms of the Cretaceous time; and it would be of great importance to compare the results of future operations with the old Cretaceous deep-sea fauna. Prof. Rupert Jones, with reference to the supposed sudden extinction of chambered Cephalopods, remarked that Cretaceous forms had already been discovered in Tertiary beds in North America, and also that cold currents could not have destroyed them, seeing that icebergs came down to the latitude of Croydon in the Chalk sea.—2. "Note on an *Ichthyosaurus* (*I. enthekiodon*) from Kimmeridge Bay, Dorset." By J. W. Hulke, F.R.S. In this paper the author described the skeleton of an *Ichthyosaurus* from Kimmeridge Bay, agreeing in the characters of the teeth with the form for which he formerly proposed the establishment of the genus *Enthekiodon.* The specimen includes the skull, a large portion of the vertebral column, numerous ribs, the bones of the breast-girdle, and some limb-bones. The first forty-five vertebral centra have a double costal tubercle. The coracoids have an unusual form, being more elongated in the axial than in the transverse direction, and this elongation is chiefly in advance of the glenoid cavity. The articular end of the scapula is very broad. The paddles are excessively reduced in size, the anterior being larger than the posterior, as evidenced by the comparative size of the proximal bones. The species, which the author proposed to name *I. enthekiodon*, most nearly resembles the Liassic *I. tenuirostris.* The length of the preserved portion of the skeleton is about 10ft., the femur measures only 2in., and the humerus 2·7in.—3. "Note on a Fragment of a Teleosaurian Snout from Kimmeridge Bay, Dorset." By J. W. Hulke, F.R.S. In this paper the author described a fragment of the snout of a Teleosaurian obtained by Mr. J. C. Mansel, F.G.S., from Kimmeridge Bay, and which is believed to furnish the first indication of the occurrence of Telosaurians at Kimmeridge. The specimen consists of about 17in. of a long and slender snout, tapering slightly towards the apex, where the præmaxillæ expand suddenly and widely. The nostril is terminal and directed obliquely forwards; the præmaxillæ ascend 2·5in. above the nostril, and terminate in an acute point; and each præmaxilla contains five alveoli. The lateral margins of the snout are slightly crenated by the alveoli of the teeth, of which the three front ones are smaller than the rest; most of the teeth have fallen out, but a few are broken off, leaving the base in the sockets. Mr. Seeley thought it likely that Mr. Hulke would eventually be led to re-establish his genus *Enthekiodon*. He remarked on the peculiar characters presented by the specimen, and referred especially to the coracoids, which were unlike those of *Ichthyosaurus*, but presented a close resemblance to those of *Plesiosaurus*. He considered that there were indications of its having been connected with a cartilaginous sternum. The scapula furnished an important character in its widening, which formed a distinct acromion process. Mr. Seeley remarked that double-headed ribs occur only in animals with a four-chambered heart; and that, considering this and other characters, there was no reason for placing *Ichthyosaurus* lower than among the highest Saurians. He considered that the Teleosaurian snout differed from all known types. Dr. Macdonald believed that what is called the coracoid has nothing to do with the shoulder-girdle, and thought it might be a part of the palate. Mr. Mansel stated, in answer to the President, that the fossils were obtained from about the middle of the Kimmeridge Clay. Mr. Etheridge suggested that it would be desirable to ascertain whether the horizon of the *Ichthyosaurus* described was the same as that of the specimens from Ely. Mr. Gwyn Jeffreys inquired as to the food and habits of the *Ichthyosaurus*. Mr. Hulke, in reply, stated that, from the presence of a stain and of numerous small scales, under the ribs, the food of the *Ichthyosaurus* probably consisted of Squids, and small fishes. He showed that the so-called coracoid was clearly a part of the shoulder-girdle.

Geologists' Association, June 2. — Rev. T. Wiltshire, president, in the chair. A paper on "Flint" was read by Mr. Hawkins Johnson, F.G.S. After stating the reasons which had induced him to pay special attention to the subject of the formation of flint, the author described the characters and mode of occurrence of nodular and tabular flint and chert. The various combinations into which silicon enters were then recapitulated, and a description of sponges introduced a statement of the theory contended for in this paper to account for the formation of chalk flints. This theory is simply that *silicon* replaced the *carbon* of the sarcode of the sponges of the Cretaceous seas. Flints are therefore merely silicified sponges. The empty shells of echinoderms were frequently used by sponges which in many cases outgrew and surrounded the shells, and these sponges afterwards becoming silicified we find the tests of echinoderms either wholly or partly embedded in chalk flints. Prof. Tennant dwelt upon the opinions of Dr. Bowerbank, and pointed out in opposition to the views of that authority that agates could not have derived their origin from sponges, since they were found in volcanic rocks. Mr. Deane, who had been associated with Dr. Mantell in his researches with respect to the origin of flints, stated that, contrary to the general belief that fossils were not found in any flints except those from the Upper Chalk, organisms had been discovered in flints from the Lower or Grey Chalk. Dr. Bedwell, who had paid great attention to this subject for a long time, denied Dr. Bowerbank's assertion that a central layer of chalk is not present in horizontal as it is in vertical tabular flint, and he could not admit the possibility of vertical walls of flint, sometimes of great height, being produced by the silicification of sponges which grew on each side of a fissure in the bed of the chalk sea, as had been contended for by Dr. Bowerbank and Mr. Johnson. Prof. Morris, after complimenting the author on the value of the paper and the knowledge of the subject which he had displayed, referred to the investigations into the origin of flint by the observers of the last century, and gave a very interesting *résumé* of the principal facts connected with the occurrence of flint in the stratified rocks. The Professor contended for the segregation of the silica of the chalk around nuclei, in opposition to the theory advocated by Mr. Johnson, which was first propounded by Dr. Brown of Edinburgh. The amount of diffused silica in the Upper Chalk is much less than in the Lower Chalk, in which flints are rare. The tests of echinoderms are never silicified, nor are phosphatic animal substances, such as bone. He believed that the sponges of the old seas, from what we know of the sponge-gravel and the Upper Greensand, were chiefly silicious, and not ceratose; and that they were extremely abundant is shown by the fact that in the Haldon Hill Greensand masses of chert occur eight feet thick, which are quite full of the spiculæ of sponges. Mr. Johnson briefly replied, but was scarcely prepared then to combat the observations of Professor Morris. Very fine collections of flints showing peculiarities were exhibited by Messrs. Johnson, Bedwell, Evans, Leighton, Deane, and Meyer.

Mathematical Society, June 8.—Mr. W. Spottiswoode, F.R.S., president, in the chair. Messrs. W. Chadwick, M.A., and J. Griffiths, M.A., were elected members of the society.—Prof. Cayley, V.P., stated results he had arrived at in his investigation of Plücker's models of certain oceanic surfaces. He had been able to identify eight out of the fourteen models in the Society's possession (presented by Dr. Hirst.) — W. Samuel Roberts, M.A., gave an account of his paper "On the Motion of a Plane under certain Conditions."—Prof. Henrici, V.P., exhibited cardboard models of two ellipsoids, of a hyperboloid of one sheet, and of an elliptic paraboloid, also stereograms of the models of surfaces exhibited at former meetings of the society.

Entomological Society, June 5.—Mr. J. W. Dunning, F.L.S., vice-president, in the chair.—The Secretary read a letter from the Rev L. Jenyns, of Bath, with reference to the reported showers of insects or other organisms at Bath, noticed at the last meeting. Mr. Jenyns had examined some of these organisms, and found they were *Infusoria*, probably *Vibrio undula* of Müller, many of them being congregated into spherical masses enveloped in a gelatinous substance. They fell during a heavy shower of rain.—Mr. Butler exhibited specimens of *Lepidoptera*, upon which he and Mr. Meldola had experimented with a view to ascertain the action of dyes. Many species had been subjected to aniline dyes, and all kinds of colours produced. Mr. Butler also found that when the insects were immersed in a solution of soda for the purpose of causing the dyes to be more readily taken, the colouring matter of the scales was completely discharged and collected at the bottom of the solution. Mr. Bicknell had subjected *Gonopteryx rhamni* to the action of cyanide of potassium, acting upon a suggestion made last meeting, and the yellow colour was changed to orange-red.—Mr. W. C. Boyd exhibited an example of *Ramia cratægata*, captured near London, the apical portion of one wing of which was changed to brown.—Mr. Müller exhibited the bell-shaped nest of *Aglena brunnea*, a spider; also galls of an undescribed species of *Phytophus* on *Betula*.—Mr. F. Smith exhibited three rare British species of *Hymenoptera*, captured by Mr. Dale in Dorsetshire, consisting of *Myrmecomorphus rufescens* (*Proctotrupidæ*), *Ichneumon glaucopterus*, and *Osmia pilicornis*.—Mr. Holdsworth, of Shanghai, communicated notes on the method practised by the Chinese in cultivating the silk-producing *Bombyx Pernyi*.—Mr. Butler read "Descriptions of Five New Species of Diurnal *Lepidoptera* from Shanghai."—Mr. Baly communicated "Descriptions of a new genus, and of some recently-discovered species of *Phytophaga*."—Mr. Kirby communicated "Synonymic Notes on *Lepidoptera*."

Statistical Society, June 20.—Mr. Hyde Clarke read a paper "On the Transmissibility of Intellectual Qualities in England." As one kind of test of intellectual exertion, he took the statistics of the writers of books in the Biographia; of 2,000 authors, 750 were born in country districts, and 1,250 in town districts. Examining the towns and the distribution in them, 333 were allotted to London, 73 to Edinburgh, and 53 to Dublin. The largest numbers in the tables beyond these were found in cathedral and collegiate cities. The deductions he drew were that intellectual activity is distributed unequally, but that it is more among the town or more highly educated population than among the rural populations. He pointed out that the larger the concentrated educated population, the larger is the intellectual development, and he referred to the like examples of Greece, Rome, and modern Europe, where the same law is to be traced. The great modern centres of industry in England occupy a low relative position in the list, and are scarcely to be noticed, but they are now beginning to contribute. He affirmed that the literary class was produced from the educated class, and not from the illiterate classes. While no educational effort will produce men of great genius, he inferred that literary attainments are in relation to literary culture or the culture of the educated classes, and that by extending education to other classes of the population, the intellectual capacity of the community will be extended and propagated within certain limits.

Manchester

Literary and Philosophical Society, April 4.—"Notes on drift of the eastern parts of the counties of Chester and Lancaster." By E. W. Binney, F.R.S., F.G.S., president. Having in a previous paper given a short description of the higher drift found in these counties, the author now proceeds to consider the thick surface covering of the general drift, which nearly hides from our view the underlying strata, except where they are exposed in river courses or in canal or railway cuttings. This generally reaches to an elevation of about 700 feet above the sea, and does not alter much in its appearance, whether it is seen at Blackpool, Ormskirk, or Liverpool, or at Burnley, Rochdale, Glossop, or Macclesfield, except being usually more divided as it is found inland, and approaches the sides of the Pennine chain. It consists of beds of till, clay, sand, and gravel. It has been treated on by various authors, a list of whose works are given.

Annual Meeting, April 18.—Mr. E. W. Binney, F.R.S., F.G.S., president, in the chair. The report of the Council was read by one of the secretaries. The Council have the satisfaction to report that the past year has been one of steady progress for the Society. The following gentlemen were elected officers of the Society and members of the Council for the ensuing year:—President: Mr. Edward William Binney, F.R.S., F.G.S. Vice-presidents: Mr. James Prescott Joule, D.C.L., F.R.S., F.C.S., Mr. Edward Schunck, F.R.S., F.C.S., Mr. Robert Angus Smith, F.R.S., F.C.S., Rev. William Gaskell. Secretaries: Mr. Henry Enfield Roscoe, F.R.S., F.C.S., Mr. Joseph Baxendale, F.R.A.S. Treasurer: Mr. Thomas Carrick. Librarian: Mr. Charles Bailey. Other Members of the Council: Mr. Peter Spence, F.C.S., Mr. William Leeson Dickinson, Mr. Henry Wilde, Mr. Robert Dukinfield Darbishire, F.G.S., Prof. Osborne Reynolds, and Mr. William Boyd Dawkins, F.R.S. Dr. Joule, F.R.S., drew attention to the remarkable atmospheric phenomenon which had been seen by several persons in Derbyshire and elsewhere, on the evening of Good Friday, April 7, and stated that he had witnessed a similar appearance near Glasgow on the day before it was observed in this neighbourhood. The perpendicular ray extended upwards from the sun to an altitude of 30°, and was very clearly defined. It was observed from half an hour before, until after the sun had set. The phenomenon was also witnessed, at the same time, by Prof. J. Thomson, who was sailing on the Firth of Clyde.

Cambridge

Philosophical Society, May 15.—"On Dr. Wiener's model of a cubic surface with twenty-seven real lines," Prof. Cayley, F.R.S.—"On the tides in a rotating globe covered by a Sea of depth constant at all points in the same latitude, attracted by a moon always in the plane of the equator; considered with reference to the tidal retardation of the earth's angular motion about its axis," Mr. Röhrs. "On the motion of imperfect fluid in a hollow sphere, rotating about its centre under the action of impressed external periodic forces, considered with reference to the phenomena of precession and nutation," Mr. Röhrs.

May 29.—"On an illustration of the empirical theory of vision," Mr. Coutts Trotter. "On a table of the logarithms of the first 250 Bernoullis Numbers," Mr. Glaisher.

New York

Lyceum of Natural History, Oct. 24, 1870.—"The Geological Position of the Remains of Elephant and Mastodon in North America," by Dr. J. S. Newberry. The genera *Elephas* and *Mastodon* existed on the globe during the Miocene Tertiary Epoch and were represented by various species from that time to the advent of man. The question is, when the two species *Elephas primigenius* and *Mastodon giganteus* are first met with in ascending the geological scale. In Europe it is claimed that remains of these species are found in the true Boulder Drift, and in California in the Pliocene Tertiary deposits. Whether either of these statements is strictly true remains to be decided by future investigations. In central and eastern North America the remains of elephant and mastodon are found abundantly in peat bogs and other superficial and recent deposits, also in some strata of unconsolidated material which are considered as belonging to the drift, although there has been much difference of opinion whether these beds form part of the true undisturbed drift, or whether they consist of re-arranged drift-materials or what is called "Modified Drift. The facts now offered seem to prove conclusively that the remains of elephant and mastodon are found in the true and unchanged drift, but only in the more recent of the drift deposits. The presence of these great mammals must therefore be considered as one of the incidents in the history of the drift, but as incidents belonging only to the last chapters in this long and somewhat eventful history. In order that the advent of the elephant and mastodon may be properly placed in the sequence of phenomena embraced in the Drift period, it will be necessary to make a brief review of these phenomena so far as they are known to us. The geological periods immediately antecedent to the Drift are the Cretaceous, which was a period of marked continental submergence, when the ocean covered most of the western half of the continent and reached several hundred feet higher than now over the basis of the eastern highlands; and the Tertiary with its three subdivisions Eocene, Miocene, and Pliocene. The Eocene was a period of continental progressive emergence—land area gradually expanding, climate subtropical. In the Miocene and Pliocene epochs the topography was in a general way what it is now, but in detail the surface was considerably more diversified, especially by the presence of great fresh-water lakes which occupied much of the surface on both sides of the Rocky Mountains. At this time there was probably a land connection between the northern part of North America and Europe on the one hand and Asia on the other. The climates of Alaska and Greenland were then as mild as that of Virginia now; the flora was luxuriant and varied, and was common to Europe, Iceland, Spitzbergen, Greenland, our continent, and North-eastern Asia; palms grew farther north than the Canadian line. The fauna was much richer than now, including elephant, rhinoceros, and many other animals not now living in either of the Americas, and indeed as large a number of the great mammals as are now found in Africa. The superficial boulders and gravels of the Drift are clearly the result of iceberg action. It is proved by the undisturbed condition of the clays below, that they must have been *floated* to their present resting places, just as boulders, sand, and gravel are floated from Greenland to the banks of Newfoundland, and there spread broadcast over the sea bottom. In the Drift deposits above the blue clay, remains of Elephant and Mastodon have been repeatedly found, still more frequently in the Peat-bogs of the present surface, and the much-discussed question has been, whether these mammalian remains were deposited with the upper layers of the Drift or were buried in them by subsequent shifting, as in the valleys of streams. The facts to which attention is now specially directed would seem to decide that question. It has long been known that in many parts of the valley of the Mississippi, wells penetrating twenty, thirty, or more feet, the superficial accumulations of *drifted* materials—clays and sands, with gravels and boulders brought from the far north—encounter sticks, logs, stumps, and sometimes a distinct carbonaceous soil. Combining facts of this character, of which records have been accumulating from year to year, with those brought to light by recent investigations directed specifically to this object, it is proved that over a great area at the West a sheet of buried timber, a vegetable soil, beds of peat covered with sphagnous moss, erect stumps, and in some cases standing trees, form a distinct line of demarcation between the older and newer drift deposits. In or above the horizon of this ancient soil have been found numerous animal remains: *Elephas*, *Mastodon*, *Castoroides* (the great extinct beaver) and some others.

Paris

Academy of Sciences, June 5.—M. Faye in the chair. M. Delaunay gave some supplementary information relative to the attempts made by the Communists to set fire to the National Observatory. The director of the establishment says that M. Yvon Villarceau was somewhat incorrect in the description of the damage done to the instruments belonging to the geodesic service, of which he is the chief and superintendent. The National Observatory, which was built more than two centuries ago under the reign of Louis XIV., is a very strong building, with thick walls, and the garden itself is at an elevation of 10ft. from the level of the surrounding land. The extent of the garden is about half an acre. The Communist forces had garrisoned it, and it was only when obliged to retreat that they tried to burn it down, which attempt was defeated only by the personal exertions of the staff, their families, and well-disposed persons in the vicinity.

The spherical copper caps of the equatorials were perforated by many holes from Versaillists' rifles, and the equatorials themselves were slightly hurt. But altogether the damage done is nothing in comparison with the harm which was contemplated.—Dr. Guyot sent a paper on Dynamite, and the means of protecting storehouses from spontaneous explosion. Dynamite is known to be a mixture of sand and nitro-glycerine. When it is wrapped in a cartridge, made as usual with paper, the capillary attraction works on the nitro-glycerine, which is slowly separated from the sand, and impregnates the protecting matter. In this new form nitro-glycerine is almost as explosive as in its ordinary liquid state, which may very easily be proved.—M. Elie de Beaumont read a circular, noticing that the next session for the British Association will be held this summer at Edinburgh. The learned perpetual secretary expects that many members will try to attend it, so that French science may have a fair representation, which is seldom the case on these occasions.

June 12.—M. Delaunay in the chair. The greater part of the members, who were obliged to escape from Paris, have resumed their seats. M. Leverrier was congratulated on having resumed his professorial duties at the Sorbonne, where he has opened this very morning his regular course of lectures on Mathematical Astronomy. Almost every scientific editor of the Parisian papers has returned also to his seat.—M. Serret presented a memoir on the principle of least action, economy of mechanical work by natural forces acting from certain centres by attraction. Euler and Lagrange had confined their exertions to show that the first differential was always zero. This was not sufficient, as such a differential may belong to a maximum if the second differential becomes negative, which was left to be demonstrated by Euler and Lagrange. The work was very difficult indeed.—M. Becquerel read a very long paper on atmospheric electricity. It was worked by himself as well as by his son, as the first part of a theory which can be reviewed only when completed. M. Becquerel, advocating the opinions started by Pelletier, thinks that the electricity of the upper regions is positive, and he says, moreover, that it comes from the sun, which is a focus of positive force. The electrical connection from the sun to our upper atmosphere is maintained through celestial space, which is not an absolute vacuum, but is filled with gases at a low pressure. The electricity of the earth is negative, and every thunder clap is a discharge between the earth and the upper regions through the air.—M. W. de Fonvielle sent a note reviewing the organisation of the Postal Telegraphic service in England, and showing that the French Government is wrong in maintaining two different administrations. The case of the French Government is very bad, as the two administrations were amalgamated during the war by the Tours delegation, under M. Steenackers, and ultimately separated. M. Buys Ballot, the celebrated director of the Utrecht Meteorological Observatory, asked from the Portuguese Government the establishment of a Meteorological station, or rather system, in the Azores Archipelago. This will result in the issuing of regular reports when the south-western gales are on their way to visit the British Islands and Western Europe. M. Delaunay, who read over the note at full length in the name of M. Buys Ballot, strongly advocated the proposition of his learned colleague. It is greatly to be hoped that the Portuguese Government will yield very shortly to the suggestion.

Academy of Inscriptions and Belles Letters, June 9.—The first sitting for a long period, as almost every member had been a refugee outside Paris, except a few officials. M. Haureau, director of the National Printing Office, explained that nothing was disturbed at this establishment. The Oriental Department is in excellent working order. The manuscripts of several members, which are kept there as well as valuable documents, are safe, owing to the mild rule of M. Debock, a working compositor, who was appointed a delegate by the Commune, and who protected also the National Archives, which are located in an adjoining building.—M. Alfred Maury, who had been left as Director of Archives by the Commune, had much trouble in protecting it against Communist fury, even with an order signed by Debock. M. Maury was praised for the energy exhibited and the courage shown in remaining at his post, running the risk of being taken as a hostage. He was much assisted in his work of protection by the gate-keeper, who severally turned out small parties of incendiaries coming with petroleum to execute their infamous orders. M. Leon Renier said that the stock of Borghesi works printed by the Academy, has perished at the same time as the Louvre Library. But the Borghesi manuscripts are safe. The 7th volume had not been distributed, and it will be necessary to print it again at the expense of the Academy, which had a limited credit for the whole edition. M. Leopold Delisle said that the manuscripts of the National Library, which had been concealed in the Archives, are safe. A few shelves had been slightly attacked by damp, but the real damage amounts to very little. There are seven nominations required in order to fill up the vacancies; death has removed four members, two ordinary members and one foreign associate. The Academy has adopted a proposition of M. Renan to fill up the vacancies gradually. On the 16th the Academy will appoint a commission for reporting upon the respective merits of candidates as foreign associate members. On the 23rd the Academy will examine the titles of the candidates for filling the seats of MM. Villemain and Alexander, whom the Academy lost before the Prussian siege. On the 30th the Academy will appoint a committee for reporting upon the candidates to two honorary memberships; but the nomination for the last two ordinary memberships will be postponed till next winter.

BOOKS RECEIVED

English.—Scrambles among the Alps, 1860-1869: E. Whymper (Murray).—The Antiseptic System: Dr. A. Sansom (H. Gillman).—Introductory Text-book of Meteorology: Dr. A. Buchan (Blackwood and Sons).—Manual of Modern Geography: Rev. A. Mackay, 2nd edition (Blackwood and Sons).

Foreign.—(Through Williams and Norgate)—Die Grundzüge des graphischen Rechnens u. der graphischen Statik: K. von Ott.—Der Seidenspinner des Maulbeerbaumes: F. Haberlandt.

PAMPHLETS RECEIVED

English.—Chemical Phenomena of the Blast Furnace, Pt. II.: J. Lowthian Bell.—Annual Address by the President of the Royal Geographical Society.—Practical and Experimental Philosophy, Pt. II: R. Willis.—Report of the Winchester College Natural History Society.—Vaccination viewed politically: F. W. Newman.—An Essay on Unsolved Ethical Questions: D. Rowland.—Transactions of the Northumberland and Durham Natural History Society.—On Barometric Differences and Fluctuations: J. K. Laughton.—Thirty-eighth Annual Report of the Royal Cornwall Polytechnic Society.—A Catalogue of Hardy Perennials, &c.: W. Robinson.—British Statesman and Churchman, No. 10.—Will the Earth become a Sun-Spot?: R. Holmes.

American and Colonial.—Australasian Medical Gazette, No. 37.—Catalogue of the Iowa University, 1870-71.—Lectures delivered at the Industrial and Technological Museum, Melbourne, during the Spring Session of 1870.—Population: its Law of Increase: N. Allen.—The Physiological Laws of Human Increase: N. Allen.

Foreign.—Ueber einige Trematoden und Nemathelminther: R. von W. Sakow.—Ofversigt af konigl., V. Akademie, Forhandlingen.—Die Geographische Verbreitung der See-gräser.

DIARY

FRIDAY, June 23.

Quekett Microscopical Club, at 8.

MONDAY, June 26.

Royal Geographical Society, at 8.30.

WEDNESDAY, June 28.

Society of Arts, at 8.—Anniversary Meeting.

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